CHAPTER 4
IMPLEMENTATION

4.1 Introduction
The 'Mari Belajar Jawi' system was developed using desktop computer before being transferred to the palmtop. For the time being palmtop Pocket PC only support any files that have Pocket PC format like Microsoft® Outlook 2000, Microsoft® ActiveSynch 3.5, Word, Excel and Windows Media Player\(^{33}\) and Macromedia Flash Player 5.0 for Pocket PC. Furthermore for this moment, there's no standalone Macromedia Flash Player for Pocket PC\(^{34}\). Thus for this research, the Macromedia Flash 5.0 is used for developing the prototype on the desktop. Then the application had to be transferred to the palmtop and run on palmtop by using the Macromedia Flash Player for Pocket PC 2002. The reasons behind using the Macromedia Flash 5.0 and other supporting tool are discussed in section 4.2.1.

Steps of the implementation are provided to illustrate user clear and concise implementation of 'Mari Belajar Jawi' application, which was implemented on the palmtop that have the Pocket PC 2002 operating system. The palmtop chosen for this research, HP iPaq Pocket PC H 1910 and its features is given to give clear view of limitations of this application when it is being played on H 1910.

\(^{33}\)http://welcome.hp.com/country/us/eng/prodserv/handheld.html
\(^{34}\)http://www.macromedia.com/software/flashplayer/pocketpc
Lastly, the considerations in designing and implementing 'Mari Belajar Jawi' application was detailed on to give clear understanding about certain constraints in using palmtop as a medium to convey knowledge.

4.2 Software Used in Developing System

4.2.1 Authoring Tool

Macromedia Flash is a type of multimedia authoring tool for web based application that is suitable for producing high quality graphic, animation and interactive multimedia application. Besides using it for web page, Macromedia Flash also have the capabilities of producing presentation for Kiosk, CD-ROM and others (Jamaludin Harun and et.al, 2001b).

Macromedia Flash is the answer in designing and delivering low-bandwidth animations, presentations and dynamic-data-driven content\(^{35}\). It offers scripting capabilities and server connectivity for creating web interfaces applications and training courses. The Macromedia Flash Player 5 for Pocket PC 2002 lets Macromedia Flash designers, developers and content providers to reach the next level of content delivery for mobile devices. In addition the Macromedia Flash Player for Pocket PC 2002 supports all Microsoft Pocket PC 2002 devices and runs on the Pocket PC 2002 operating system.

\(^{35}\) http://www.macromedia.com/software/flashplayer/pocketpc
Macromedia Flash 5.0 was selected as authoring tool for implementation on Pocket PC. There are various reasons for using it. The reasons are stated below:

1. Macromedia Flash files are compact and perfectly suited for wireless networks where transfer rates usually run between 9.6 kbps and 19.2 kbps\textsuperscript{36}. Thus it's suitable and ideal for mobile devices like Pocket PC, which have limited storage capabilities.

2. Macromedia Flash enables web professionals\textsuperscript{37} to develop content once and deploy it everywhere. Its content is viewable across multiple browsers, platforms and Internet appliances and makes it the perfect choice for Pocket PC.

3. Macromedia Flash help the designers and developers building portable and customizing user interface for the device, produce seamless content and preserve the user experience.

4. Macromedia Flash is accessible where the developers can easily deploy existing content to PCs and Linux machines using Internet Explorer and Netscape applications without recreating the content.

\textsuperscript{36} http://www.macromedia.com/software/flashplayer/pocketpc
\textsuperscript{37} http://www.handago.com
4.2.2 Editing and Supporting Tool

The editing and supporting tools used are Sound Forge 4.0 for sound editing, Adobe Photoshop 6.0 for graphic and image editing and lastly, Jasc Paint Shop Pro 6.0 and Animation Shop 6.0 for animation.

4.3 Palmtop HP iPaq PocketPC H 1910

4.3.1 Introduction

The HP iPaq Pocket PC H 1910 is an H 1900 series Pocket PC from Hewlett Packard and it was first released on November 2002. It is thin and light with a clear and dazzling transreflective color display. The iPaq h1910 Pocket PC offers a great combination of features and distinctive design that fit user lifestyle. Please refer to Figure 4.1 to see the comparison of H1910 with a deck of cards. While figure 4.2, 4.3 and 4.4 show the picture of certain elements stated in the specification.
4.3.2 HP iPaq Pocket PC H1910 Specification

Figure 4.1: Comparison of H1910 Design with deck of cards


Figure 4.2: H1910 Display

The following is the H 1910 specification\textsuperscript{38} and Table 4.1 summarizes the features\textsuperscript{39} of HP iPaq Pocket PC H 1910.

\textsuperscript{38} http://h18000.www1.hp.com/products/quickspecs/11491_na/11491_na.html
\textsuperscript{39} http://welcome.hp.com/country/us/eng/prodserv/handheld.html
1. Power Button
2. Color Display
3. Today Button
4. Inbox Button
5. 5-Way Navigation Button
6. Contacts Button
7. Calendar Button

Figure 4.5: Diagram of H 1910 Specification


<table>
<thead>
<tr>
<th>General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Release Date</td>
<td>November 2002</td>
</tr>
<tr>
<td>OS Provided</td>
<td>Microsoft Pocket PC 2002</td>
</tr>
<tr>
<td>Installed RAM</td>
<td>64 MB</td>
</tr>
<tr>
<td>Installed ROM(Max)</td>
<td>16 MB Flash</td>
</tr>
<tr>
<td>Weight</td>
<td>4.2 oz</td>
</tr>
<tr>
<td>Feature</td>
<td>Details</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Width</td>
<td>2.8 in</td>
</tr>
<tr>
<td>Depth</td>
<td>0.5 in</td>
</tr>
<tr>
<td>Height</td>
<td>4.5 in</td>
</tr>
<tr>
<td>Input Device Type</td>
<td>Touch screen</td>
</tr>
<tr>
<td>Audio Input</td>
<td>Microphone</td>
</tr>
<tr>
<td>Audio Output</td>
<td>Speaker</td>
</tr>
<tr>
<td>Digital Audio Standard Support</td>
<td>MP3, WMA</td>
</tr>
<tr>
<td>Processor</td>
<td>Intel PXA250 200 MHz</td>
</tr>
<tr>
<td>Modem</td>
<td>No</td>
</tr>
<tr>
<td>Built in Devices</td>
<td>Display</td>
</tr>
<tr>
<td>Package Contents</td>
<td>H1910 handheld, 1 x Lithium Ion battery, 1 x USB cable, power adapter, charging adapter, user guide, HP iPaq Pocket PC Companion CD</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td></td>
</tr>
<tr>
<td>Display Type</td>
<td>3.5 in transreflective color TFT</td>
</tr>
<tr>
<td>Color Support</td>
<td>16 bit(64 color)</td>
</tr>
<tr>
<td>Maximum Resolution</td>
<td>320 x 240</td>
</tr>
<tr>
<td>Backlit Display?</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Expansion/Connectivity</strong></td>
<td></td>
</tr>
<tr>
<td>Connectivity device included</td>
<td>Docking cradle</td>
</tr>
<tr>
<td>Expansion slot total</td>
<td>1 x Multimedia Card/ Secure Digital Card</td>
</tr>
<tr>
<td>Port total/connector type</td>
<td>1 x IrDA, 1 x headphone, 1 x microphone</td>
</tr>
<tr>
<td>Wireless Connectivity</td>
<td>1 x IrDA, via memory card</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td></td>
</tr>
<tr>
<td>Battery installed(maximum)</td>
<td>1 x Lithium Ion Battery</td>
</tr>
<tr>
<td>Power supply included</td>
<td>Power adapter-external</td>
</tr>
<tr>
<td><strong>Disclaimer</strong></td>
<td></td>
</tr>
<tr>
<td>Processor speed</td>
<td>The unit &quot;MHz&quot; measures microprocessor internal clock</td>
</tr>
<tr>
<td>Modem maxim data rate</td>
<td>56k modems are capable of receiving data at speeds up to 56 kbps. However, due to FCC rules that restrict power output, maximum download speeds are limited to about 53 kbps. Data transmitting speeds are limited to 33.6 kbps. Actual speeds depend on many factors and are often less than the maximum possible.</td>
</tr>
</tbody>
</table>

Table 4.1: Specification of HP iPaq Pocket PC H 1910 series

4.3.3 Reasons Behind Choosing HP iPaq Pocket PC H 1910

There are many types and brands of palmtop in the market, from Palm OS to Pocket PC and even of Linux operating system. However H 1910 was chosen because of certain criteria.

1. It is the cheapest Pocket PC, priced RM 1388, compared to other Pocket PC. The H 1910 has an Intel 200mhz processor, Transflective type TFT Color with LED backlight and 64 SDRAM. The transflective screens reflect light to illuminate the screen (for outdoor viewability and power savings) and also have backlighting. This means that it is outdoors viewable, have deeper
and richer colors compared to non-transflectives. The transflective screens are more color-accurate and have darker black.

2. The removable battery provides capability for extended use while away from a power source. The SD/MMC memory card slot could be used for transferring and storing music, pictures and more. In this research, the MMC was purchased for storing the ‘Mari Belajar Jawi’ application without interrupting the OS.

3. The H1910 is small and thin with just a weight of only 4.2 oz and its suitable to be brought anywhere even for the children. It slimmer than 5450 and H 1910 can easily fits into user’s pocket. In the diagram below, it shown 5450 on top of the 1910. This shows how slim and small the 1910 is. Today, H 1910 is the smallest and lightest Pocket PC. Please refer the Figure 4.6 for comparison of the thicknesses.

![Comparison between 5450 and H 1910](http://h18000.www1.hp.com/products/quickspecs/11491_na/11491_na.html)

Figure 4.6: Comparison between 5450 and H 1910

4. The H1910 Pocket PC sound system for both speaker and earphones is good. User should notice that, the earphone jack is 2.5mm (cell phone size) rather than the standard 3.5mm audio mini-jack used on most consumer electronics devices and other multimedia-capable PDAs. Thus, its really suitable for displaying the ‘Mari Belajar Jawi’ application using audio element as one of the ways to convey the knowledge.

4.4 Guidelines of Optimal Delivery

4.4.1 The User Interface

The consistent user interface (UI) elements for the site or application are one of the philosophies in designing user interface40 (Ghazali Sulong and et.al, 1997). There are some new challenges when developing Macromedia Flash content for the palmtop Pocket PC 2002. The Pocket PC 2002 project was actually a portable version of a project originally developed for delivery on desktop, using the same familiar assets, but the versions are optimized for PDAs.

Macromedia Flash projects for Pocket PC 2002 makes the users to like the application better than websites. The interface should be apparent and self-documenting. The user should be able to figure out how to use the interface just by looking at it or by using it. It gives users a clear exit.

40 http://www.macromedia.com/software/flashplayer/pocketpc
4.4.2 Screen Economy

Users should know that, different devices have the different screen size. While most development environments facing difficult method for dealing with this issue, fortunately Macromedia Flash vector technology can be set to scale to fit the display size of the device 41.

Smaller screen will not limited to fewer pixels. A scaled-down version of an 800x600 website is not a viable way to display information on a device. On devices, user must always place fewer elements on-screen at any given time.

User should always aware that the Pocket PC 2002 has the small screen size. Eventhough the devices provide both vertical and horizontal scroll bars but users are recommended to fit all information on a single page.

The resolution of Internet Explorer for Pocket PC 2002 is 240x320 pixels 42. However, the user interface of a Pocket PC 2002 set two areas that cannot be used for content:

• The Menu bar at the bottom of the screen

• The Caption bar at the top of the screen

User can refer to thew Figure 4. 7 for better understanding.

41 http://www.macromedia.com/software/flashplayer/pocketpc
42 http://www.macromedia.com/software/flashplayer/pocketpc
Figure 4.7: Pocket Internet Explorer Dimensions

Source: http://www.macromedia.com/software/flashplayer/pocketpc

4.4.3 Personalization

If the user downloads or views content on the device while also storing a personal address book or calendar, the content become specific to the individual.\(^{43}\)

4.4.4 Redeployment

The Macromedia Flash content can be reuse for multiple devices and platforms and deploy it at multiple time.\(^{44}\) Even though the different device having a different screen size, Macromedia Flash handles itself well to deploying onto different devices.

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43 http://www.macromedia.com/software/flashplayer/pocketpc
44 http://www.macromedia.com/software/flashplayer/pocketpc
4.4.5 Input Methods

There are varieties of input methods that maintained by Pocket PC 2002. These methods include the stylus (similar to a mouse in function, but operated like a pen) and a screen-based keyboard where it being used to enter text into any Macromedia Flash form and to control movies. It also includes a directional pad that can be remapped to perform specific functions and external keyboard\footnote{http://www.macromedia.com/software/flashplayer/pocketpc} that the function keys are not supported.

As the device does not support certain keys, it is a good idea not to use them but providing alternatives. For example, small touchable icons that can be used with a pen or a finger are often a good substitute. Furthermore, developer should avoid creating content that requires a key press.

The most important thing that the developer should bear in mind when creating Macromedia Flash content for devices is that the stylus is the main method of interaction between the user and the device.

4.4.6 Buttons

The buttons that are built to run on a Pocket PC 2002 must be treated differently from those on desktop. The most significant difference is that Pocket PC 2002 does not use a mouse as input device and has no cursor and just uses a pen tap. A rollover state is not needed and should be avoided.
4.4.7 Right-Click Menu

The right-click Macromedia Flash menu will be invoked when the user holding down the stylus pen. However, the right-click menu will not be activated if the pen is held down over a button.

4.4.8 Printing

Macromedia Flash Player for Pocket PC supports printing function. The device should be connected to a printer through the infrared (IR) port at the time that the print commands are processed.

4.5 Steps of Creation and Implementation

The implementation method is discussed for the purpose of proving how multimedia application, in this case, ‘Mari Belajar Jawi’ could be implemented on the palmtop. In addition, any owners of palmtop Pocket PC 2002 can use the steps to test the application.

1. Developed a multimedia application in the desktop computer and in this case, ‘Mari Belajar Jawi’ using the Macromedia Flash 5.0. Macromedia Flash 5.0 should support any format files that would be used in the application.

2. After developing the application, testing is done by using Control Enter Command. If no error then we can proceed to step 3.
3. The file ‘Mari Belajar Jawi’ can be published. Go to Menu Bar and select:

   i. File
   ii. Publish Setting

The dialogue box for format file will appear as the following figure.
Choose the Flash (.swf) and HTML (.html) and then click the ‘Publish’ button.
Figure 4.8: Dialog Box for Publish Setting

4. Before exporting the files, the palmtop must be synchronized with PC using the Microsoft ActiveSync 3.5. The synchronization process can be done using the IR or USB connection. In this research, the USB connection is being used to synchronize the data. The published 'Mari Belajar Jawi' application then exported to palmtop.
5. User can copy the file from PC to palmtop using USB connection. The file ‘Mari Belajar Jawi’ can be put to any folder that user feels suitable. However its recommended that user use extra storage called Multimedia Card (MMC). This MMC will avoid ‘Mari Belajar Jawi’ from disturbing the process of OS in the provided RAM that might cause delay of the application when its being run.

6. To display the application, user can tick the tab in the palmtop. From palmtop, tab the HTML file.

7. Lastly the Internet Explorer browser can play ‘Mari Belajar Jawi’ application.

4.6 ‘Mari Belajar Jawi’ Interface on Palmtop

In this topic, users are given an overview of the actual interface when it being put on the palmtop. The interface is remaining the same that has showed in the previous topic. However, in this topic users will see the interface in the small version. The following are the figures of certain interface in the system.
Figure 4.9: Interface of Introduction Page on Palmtop

Users have to tab the balloons in the interface by using the stylus pen provided.
Figure 4.10: Interface of ‘Belajar AlifBaTa’ Page on Palmtop
Figure 4.11: Interface of ‘Baca AlifBaTa’ Page on Palmtop
Figure 4.12: Interface of ‘Baca AlifBaTa’ Page on Palmtop